THE EFFECTS OF AN ENHANCED GOAL SETTING STRATEGY ON GOAL PROGRESS AND WELL-BEING

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THE EFFECTS OF AN ENHANCED GOAL SETTING STRATEGY ON GOAL PROGRESS AND WELL-BEING

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SUMMARY

Although the benefits of difficult, specific goal setting on performance are well-documented (e.g., Locke & Latham, 1990), it remains unclear how anticipatory action planning may enhance these effects. The current study investigates the effects of an enhanced goal setting training intervention using smartphone technology on self-reported goal progress and well-being as well as the moderating effects of individual differences in action orientation/state orientation (ASO). Ultimately, neither the enhanced nor the control strategy boosted goal progress nor did ASO moderate the intervention. Unexpectedly, participants receiving the enhanced strategy reported significantly less positive affect up to one week after using the strategy despite making equivalent goal progress to participants in the control condition. Results are discussed in terms of the efficacy of enhanced goal setting on performance, well-being, exploratory post-hoc tests, and in relation to previous results obtained by Fishbach and Hofmann (2015).

CHAPTER 1. INTRODUCTION

One only needs to look at the stationary (or, worse yet, increasing) number on the bathroom scale to understand the difficulty that people experience in translating desired goals into outcomes. Though people frequently set specific goals to accomplish their intentions, intentions alone account for less than 40% of the variance in behavior (Armitage & Conner, 2001). Over the past few decades, researchers have focused on the effectiveness of various elaborate goal-setting strategies to accomplish intentions. For example, findings by Gollwitzer and his colleagues (see, e.g., Gollwitzer, 1993) have demonstrated that goal setting strategies that incorporate implementation planning facilitate performance through their directive effects on attention and action when encountering obstacles. Recent findings by Fishbach and Hofmann (2015) provide further support for the facilitative role of implementation strategies on performance in the context of a task training intervention. Specifically, Fishbach and Hofmann used an experience sampling methodology (ESM) to have participants identify daily goals using their smartphones over a one-week period. After identifying their goals, participants received either control instructions or identification and resolution (IR) instructions that prompted them to think of barriers to their goals and resolutions to those barriers. The current study is intended to partially replicate and extend Fishbach and Hofmann's (2015) findings that use smartphone technology to train and track participant progress. In addition, I investigated the efficacy of the augmented goal setting training on retention and transfer to a novel situation one week following the end of training.

To provide a background for the current study, I provide a brief overview of the literature. First, I define and discuss goals and research findings that document how goals influence goal-related progress. Next, I review self-control theory and the relationship between self-control and goal progress. I then draw parallels between research findings derived from self-control and findings derived from research on the effects of goal implementation intentions. After exploring these issues at a between-subjects level, I review how individual differences in global action/state orientation (ASO) affect goal setting, goal progress, and goal attainment. In the concluding section, I explore the retention and transfer of enhanced goal setting strategies and how goal progress and goal attainment relate to well-being.

1.1 Goals

Motivational researchers generally agree that goals facilitate task performance, though debate continues on exactly how goals should be defined and operationalized to achieve the best behavioral outcome (Elliot & Niesta, 2009; Kanfer, Frese, & Johnson, 2017). For example, Kanfer, Frese, and Johnson (2017) defined goals as internal representations of desired states that direct attention, organize action, and sustain effort aimed at achieving those states.

According to goal setting theory (Locke & Latham, 1990), however, not all self-determined goals are equally effective. In general, specific goals ("I will complete four reports today") make goal attainment more likely than vague goals ("I will complete many reports today"). Furthermore, difficult goals tend to increase performance more than easy goals (Locke & Latham, 1990, 2002). Meta-analytic reviews have found effect sizes for difficult and specific goals ranging between d=.42 to d=.8 for both individuals

and teams (Kleingeld, van Mierlo, & Arends, 2011; Locke & Latham, 1990). Though specific and difficult goals bolster performance in many circumstances, Locke and Latham (1990, 2002) suggested that three factors moderate the goal-performance relationship: goal commitment, feedback, and task complexity. All else being equal, the more committed individuals are to the goal, the more specific the goal, and the more challenging the goal, the higher the performance.

Locke and Latham (1990, 2002) proposed that goals influence performance by: (1) directing attention, (2) increasing effort, (3) increasing persistence, and (4) motivating the individual to develop effective strategies for goal attainment. The study focuses on the fourth mechanism – strategy development – as it affects performance and other outcomes. Although some goal-setting studies have examined the effect of strategy on task performance, Kanfer et al. (2017) noted that there has been less attention to understanding the effects of action planning as a distinct aspect of goal setting.

1.2 Self-Regulation and Self-Control Theory

Individuals who seek to accomplish their goal must often avoid temptations that could derail goal attainment. This is the basic problem of self-control during goal pursuit. Ultimately, self-control involves a unique form of self-regulation in which an individual must override the temptation of engaging in an attractive activity that will provide short-term satisfaction but detracts from the allocation of effort to accomplishment of the longer-term target goal (Fishbach & Converse, 2011; Fishbach & Shah, 2006; F. H. Kanfer, 1970;). To overcome these dilemmas, individuals must engage in self-control to overcome temptation and support attainment of the longer-term goal. Effective self-control consists of two sequential parts: (1) identification of potential

conflicts that require self-control, and (2) developing strategies to effectively resolve the conflict (Fishbach & Converse, 2011; Myrseth & Fishbach, 2009).

According to Fishbach and her colleagues (e.g., Myrseth, 2010; Myrseth & Fishbach, 2009), the first aspect of self-control, identifying conflicts, focuses on the way the conflict is framed; that is, how individuals frame short-term temptations in relation to long-term goal attainment. For instance, Myrseth (2010) found that individuals took more chocolates (d = .34) when a food stand sign said "April 12th Food Stand" than when it said "Spring Food stand." She concluded that the "Spring Food Stand" sign cued participants to think of the conflict more broadly, whereas the "April 12th Food Stand" sign cued participants to focus on a specific conflict. In other words, the wide frame increased awareness of the potential for further conflicts, and the narrow frame caused participants to view the indulgence as a solitary exception. All else being equal, the wider the frame of the perceived conflict, the more likely people are to identify the short-term reward as a threat to attainment of longer-term goals. Similarly, a second aspect of identification concerns the consistency of the conflict (Fishbach & Converse, 2011; Myrseth & Fishbach, 2009). Individuals assess whether the temptation will set a precedent that may derail goal attainment. Thus, conflicts perceived as an isolated incident (eating a slice of cake because it's your birthday) are less likely to be identified as a threat of becoming a regular occurrence (such as eating a slice of cake because of a bad day). All else being equal, the more consistency individuals perceive in a conflict, the more likely they are to identify it as a threat to attainment of their long term goal.

Identification of potential temptations represents only one part of the self-controlling response. After individuals identify temptations, they must develop effective

strategies by which to resolve the conflict. Counteractive control theory (Trope & Fishbach, 2000) posits that individuals resolve the tension between the immediately alluring temptations and the delayed gratification of long-term goal attainment by creating psychological imbalances in the valences of the temptations and goals. As one example of counteractive control theory, dieters may tell themselves that the taste of the chocolate that they deny themselves pales in comparison to how happy they will feel when they fit into their new clothes. By counteracting the immediate anticipated satisfaction of the temptation with anticipated benefits of behavior to accomplish the longer-term goal, the temptation seems less appealing. Researchers have identified seven critical strategies that individuals may use to create this psychological asymmetry in favor of long-term goals. While a full coverage of each strategy is beyond the scope of this current paper (see Fishbach & Converse, 2011 for the entire list of strategies), the present study addresses three of these strategies, namely: avoidance/approach toward temptations/goals, activation/inhibition, and behavioral precommitment.

1.2.1 Avoidance/Approach Strategies

Similar to how goals direct attention toward goal-congruent behavior and away from counterproductive behavior (Locke & Latham, 1990, 2002), the strategy of identifying effective resolutions to goal conflicts is believed to help individuals develop approach goals and avoid temptations. Furthermore, the framing of goals as approach versus avoidance strategies may be nonconscious as well (Fishbach & Converse, 2010, 2011; Trope & Fishbach, 2000). For instance, in a series of experiments, Fishbach and Shah (2006) randomly assigned participants to either push or pull a joystick when they saw goal-related or temptation-related words. They found that participants pulled goal-

related words significantly quicker than temptation-related words. Likewise, participants pushed temptation-related words away quicker than goal-related words.[1] Fishbach and Shah interpret these results as suggestive that people may be nonconsciously hard-wired to approach goal-related constructs while avoiding or distancing themselves from temptations.

1.2.2 Activation/Inhibition

Findings by Bargh and his colleagues (Bargh, 1990; Bargh, Gollwitzer, Lee-Chai, Barndollar & Trötschel, 2001) also indicated that goals serve to help individuals interpret and act in conflict situations. Similar to other cognitive structures, like schemas, resolution of conflicts operate in the background to influence behavior. For instance, primed goals help individuals detect discrepancies in their performance and make goals and goal-related knowledge more easily accessible. By activating higher-order goal constructs, people are more easily able to access goal-congruent knowledge. Likewise, by inhibiting temptation-related constructs, individuals may reduce their likelihood of succumbing to temptation (Fishbach & Converse, 2011; Moskowitz & Gesundheit, 2009).

1.2.3 Behavioral Precommitment

Individuals who precommit themselves to behaviors that facilitate goal accomplishment are posited to be more effective in avoiding conflicts that derail goal

[1] Enough information was not provided to calculate effect sizes; however, group means were provided. Participants' mean time of pulling goal-related words was 615.01 milliseconds (ms) compared to their mean time to pull temptation-related words of 636.66 ms ($p < .05$). Similarly, participants pushed temptation-related words quicker (648.11 ms) than goal-related words (718.84 ms, $p < .01$)

progress (Brehm, 1966; Fishbach & Converse, 2011; Schelling, 1984; Trope & Fishbach, 2000). For example, Wertenbroch (1998) found that individuals low in impulsiveness precommit themselves to forgoing substantial bulk-good discounts for vice-related foods (e.g., cookies) in order to prevent themselves from having the temptation in their house (*d* = .22). By identifying a plan of action in advance, individuals minimize their interaction with the temptation, thus protecting the integrity of their counteractive strategies.

Collectively, these conflict resolution strategies work together to minimize the demands on an individual's self-control resources when navigating self-control dilemmas. As a final note, individuals typically only need to rely on counteractive control strategies for difficult goals (Fishbach & Converse, 2010).

1.3 Implementation Intentions

Another approach to understanding self-control strategies that highlights advance planning stems from theorizing and research by Gollwitzer and his colleagues (see, e.g., Gollwitzer, 1999) on the role of implementation intentions. Gollwitzer and Sheeran (2006) defined an implementation intention as an act of will "that furnishes [a] goal intention with an if-then plan specifying when, where, and how the person will instigate responses that promote goal realization" (p.70). In contrast to implementation intentions, goal intentions are "self-instructions to attain certain outcomes or perform particular behaviors and typically take the format of 'I intend to reach *Z*!'" (p.70). Thus, individuals rely on their implementation intentions to achieve their superordinate goal intentions. For instance, a dieter with the goal intention of avoiding dessert may form the following implementation intention: "If the waiter asks if I want the dessert menu tonight, then I will tell him no."

Though identify and resolve (IR) instructions as suggested by Fishbach and her colleagues do not follow the formal if-then format of implementation intentions, both the Fishbach and Gollwitzer approaches address a similar issue; namely, developing goal strategies that identify and reduce potential self-control stressors. For example, the same dieter could identify the same barrier to his dessert-free goal ("the waiter will ask if I want the dessert menu tonight") and an identical resolution to that barrier ("I will tell the waiter no when he/she asks"). Thus, while the two approaches employ different formats, both serve to help individuals sustain goal-directed behavior and avoid temptations.

According to Gollwitzer (1993), implementation intentions help achieve goal attainment above and beyond goal intentions in two critical ways. First, they make goals and potential barriers cognitively accessible (Gollwitzer, 1993; Parks-Stamm & Gollwitzer, 2009; Webb & Sheeran, 2008). As a result, planned opportunities and the benefits of goal pursuit can be recalled more easily. This feature of implementation intentions can help people get started with their goals and persist during unpleasant goal execution (Gollwitzer, 1999). Second, despite being consciously formed, implementation intentions speed up automatic processing (Gollwitzer, 1999; Parks-Stamm & Gollwitzer, 2009; Sheeran, Webb, & Gollwitzer, 2005). This quicker processing speed allows individuals to act before counterproductive behaviors can be considered. By making the goal-related behavior more automatic, action planning during the goal phase helps to reduce an individual's cognitive load, thus freeing up mental energy for people to focus more intently on goal accomplishment. Ultimately, by making goal-related constructs more accessible and quicker to process, goal setting strategies that include future action

planning increases the likelihood of goal attainment over goal setting strategies that do not.

The incorporation of implementation intentions in the goal setting process has been shown to be effective with a wide range of goals, such as increasing fruit consumption (d = .51, Adriaanse, Vinkers, De Ridder, Hox, & De Wit, 2011) and boosting scholastic test scores (d = .71, Bayer & Gollwitzer, 2007). Moreover, implementation intentions also benefit an equally diverse range of populations, such as children (η^2 = .09, Gratton, Povey, & Clark-Carter, 2007) and patients with frontal brain lesions (d = .57, Lengfelder & Gollwitzer, 2001). Finally, a meta-analysis by Gollwitzer and Sheeran (2006) found that, even across a variety of goals and populations, goals that include explicit implementation intentions show medium to large effects on goal attainment with an average effect size of d = .65.

1.3.1 Summary

Theories and findings across a variety of research paradigms point to the importance of goal setting procedures that incorporate the explicit development of strategies for resolving self-control conflicts that may arise during goal pursuit. In particular, findings by Fishbach and Gollwitzer suggest that such strategies not only involve identification of potential conflicts, but also an advance plan of action for overcoming or resolving the conflict. The current study seeks to provide further evidence for this notion by comparing goal progress in a control training condition to goal progress in an identification and resolution (IR; experimental) condition. Accordingly, I hypothesized the following:

Hypothesis 1: There will be a between-subjects main effect of IR goal strategy training on self-reported goal progress (.4 < d < .6). Participants receiving the IR (experimental) intervention will achieve significantly more goal progress than participants in the control condition.

Hypothesis 1a: There will be a positive, within-subjects effect of the IR intervention on self-reported goal progress (.4 < d < .6) from baseline to the end of the training period, but no significant effect for participants in the control condition.

Past research supports the notion that implementation intentions boost goal progress (Gollwitzer & Sheeran, 2006). While the identification and resolution strategies used in the present study do not follow the exact if-then formula of implementation intentions, they require individuals to arrive at analogous conclusions. Similarly, the wording of the strategies mirrors the wording used by Fishbach and Hofmann (2015), who also found positive results.

In addition to evaluating the effects of goal strategy training on goal progress, I will also investigate the perceived utility of IR training. Because implementation intentions have been found to be an effective strategy for goal attainment in a variety of settings (Gollwitzer & Sheeran, 2006) and are hypothesized to boost goal progress, individuals in the IR training condition should perceive the training to be more useful than do individuals in the control training condition (similar to the control instructions used in Fishbach and Hofmann [2015]). Thus, I hypothesized that:

Hypothesis 2: Participants in the IR training condition will rate the training as more helpful than participants in the control training condition (.2 < d < .5).

Hypothesis 3: Participants in the IR training condition will be more likely to endorse continued use of the goal strategy training than participants in the control condition (.2 < d < .5).

1.4 Action-State Orientation

Over the past half-century, researchers have identified a variety of individual differences, such as achievement motivation and conscientiousness, that affect how individuals set and ultimately attain goals (Kanfer et al., 2017). For instance, individual differences in various traits can affect a person's choice of how difficult to set their goals, as well as how committed individuals remain to their goals (Latham et al., 2011).

One particularly interesting non-ability trait that may affect goal progress is action-state orientation (ASO; Kuhl, 1994; Kuhl & Beckmann, 1994). According to Kuhl and his colleagues (Koole, Kuhl, Jostmann, & Finkenauer, 2006; Kuhl, 1994, 2000) 1994), ASO refers to stable individual differences in action propensity that are learned through socialization. ASO is typically assessed using a self-report measure originally developed by Kuhl (1994) that identifies three distinct dimensions of the construct: preoccupation, hesitation, and volatility. Each dimension receives its name from its state-oriented component, but also has opposing action-oriented ends: disengagement, initiative, and persistence, respectively. Furthermore, each dimension represents a different aspect of performance that could thwart goal-directed performance. Thus,

individuals could be high in action orientation on some dimensions but low in action orientation (i.e., state-oriented) on other dimensions.

The preoccupation-disengagement dimension captures individuals' general cognitions around their goals. Specifically, individual differences in this dimension reflect how much an individual ruminates about goals and goal-related failures. Individuals who are state-oriented in this dimension report high levels of rumination about goals and goal-related failures. In contrast, individuals who are action-oriented on this dimension (i.e., high in disengagement) report being able to easily stop dwelling on past failures and appropriately gauge when to abandon a goal (Diefendorff et al., 2000; Jostmann & Koole, 2009).

The hesitation-initiative dimension evaluates individual differences in ASO related to goal pursuit behaviors (Diefendorff et al., 2000). Individuals high in hesitation (i.e., state-oriented) report difficulty beginning goal-directed behaviors. In contrast, individuals high in initiative (i.e., action-oriented) on this dimension report ease in moving toward their goals. For example, individuals high in hesitation would consistently be unable to bring themselves to the gym, whereas individuals high in initiative would encounter little difficulty getting to the gym once they set the goal for themselves.

The volatility-persistence dimension of ASO captures individual differences in how long an individual can maintain action-oriented processes, such as disengagement and initiative (Diefendorff et al., 2000). Individuals high in volatility (i.e., state-oriented) become distracted when working towards their goals and frequently get off-task. In contrast, persistent individuals (i.e., action-oriented) can maintain their goal focus despite

setbacks or distractions. Thus, a dieter high in volatility may be distracted by her bad mood and then eat the cookie she was trying to avoid. In contrast, a dieter high in persistence would be much more likely to stay focused on her goal of avoiding sweets despite her bad mood. Ultimately, when individuals are action oriented in each domain, they tend to have superior goal-performance, as detriments in any domain can detract from goal progress. Although Kuhl conceptualized and assessed ASO in terms of three distinct dimensions (preoccupation, hesitation, and volatility), most research investigating the influence of ASO on behavior has used an aggregated measure of ASO that equally weights each of the three dimensions (for an example, see McElroy & Dowd, 2007). For clarity and simplicity, the remainder of this paper will discuss individuals as high or low in action orientation. However, because ASO is a single dimension, if an individual is high in action orientation, then he or she is implicitly low in state orientation and vice versa.

Individuals high in action orientation across all three dimensions are hypothesized to facilitate context-specific intentions effectively and promote attention and cognitive resource allocations toward goal attainment. In contrast, individuals who are low in action orientation – that is, state-oriented individuals – are proposed to have reduced cognitive capacities due to frequent ruminations and indecisiveness about how to accomplish their goals (Diefendorff, Hall, Lord, & Strean, 2000; Kuhl, 1994). ASO has been shown to predict goal–performance relationship in a variety of achievement contexts, such as reducing overeating ($r = .18$, Palfai, 2002) and binge drinking ($r = .16$, Palfai, McNally, & Roy, 2002)., albeit with relatively small effects.

Moreover, high action orientation increases the likelihood of goal attainment both cognitively and affectively. First, high action orientation moderates general executive functioning (Wolff et al., 2016) and appears to make individuals less susceptible to self-control depletion (Dang, Xiao, Shi, & Mao, 2015; Gröpel, Baumeister, & Beckmann, 2014). By doing so, action orientation seems to reduce people's cognitive load, resulting in individuals having more attention to focus on their goals and potential temptations (Kuhl, 2000). In contrast, due to their cognitive overload, low action-oriented individuals tend to perform worse on goals when told to focus, presumably overwhelming these individuals because they do not have cognitive resources to spare ($\eta_p^2 = .12$, Ruigendijk & Koole, 2014).

In addition to freeing up cognitive resources, high action oriented individuals can better regulate their affect and more easily overcome setbacks than their state-orientated counterparts (Diefendorff et al., 2000; Herrmann & Brandstätter, 2013; Kuhl, 1994). According to the shielding hypothesis (Herrmann & Brandstätter, 2013), when high action-oriented individuals experience an action crisis, or setback, they label the experience as contrary to what they expect of themselves and then continue to try strategies until they persist or disengage from the goal. In contrast, low action-oriented individuals label the experience of failure as congruent with their self-expectations and may prematurely accept failure. Furthermore, after experiencing setbacks, high action-oriented people view it as an opportunity for personal growth, whereas low action-oriented people become at risk for succumbing to learned helplessness (Herrmann & Brandstätter, 2013; Kuhl, 2000).

1.4.1 Summary

ASO is conceptualized as a relatively stable individual difference in cognitive and affective propensities to conceptualize and act upon goals. Specifically, individual differences in ASO are posited to exert moderating effects on goal progress through their cognitive and affective effects on processing of goal setbacks and goal-related behaviors. Accordingly, I hypothesized the following:

> *Hypothesis 4: There will be a positive main effect of individual differences in ASO, such that participants higher in global action orientation will achieve more goal progress than participants lower in global action orientation (i.e., high in state orientation, .3 < d < .4).*

Action-oriented individuals regularly achieve higher levels of performance than state-oriented individuals for a variety of reasons, such as sustaining self-control for longer (Dang et al., 2015) and employing better strategies for attaining their goals (Kuhl, 2000). Furthermore, Fishbach and Hofmann's (2015) measure of locomotion conceptually mirrors high action orientation, and they similarly found a main effect of locomotion. Thus, I hypothesized that:

> *Hypothesis 5: Individual differences in ASO will moderate the effectiveness of the IR treatment, such that the effect of IR training on goal progress will be greater for individuals lower in action orientation (i.e., high in state orientation), and that individuals lower in action orientation (i.e., high in state orientation) will show the lowest level of goal progress in the control condition (.2 < d < .3).*

Because low action-oriented individuals tend to struggle with ruminating about which action to take and hesitating to initiate goal-directed behavior (Diefendorff et al., 2000; Kuhl & Beckmann, 1994), these participants were expected to benefit more from the IR training than high action-oriented individuals. Furthermore, because this self-control intervention helps individuals identify barriers and their resolutions, it will "nudge" individuals to end their ruminating and hesitating, but can be expected to have no significant effect on boosting persistence. As such, individuals scoring low in initiative and disengagement (i.e., high in hesitation and preoccupation, respectively) will especially benefit from the intervention.

Hypothesis 5a: Participants low on the initiative and disengagement ASO subscales (Hypothesis 5b) will make significantly greater goal progress in the IR condition than the control condition (.2 < d < .3).

1.5 Goal Strategy Training and Subjective/Affective Outcomes

According to Diener, Suh, Lucas, and Smith (1999), subjective well-being consists of "people's emotional responses, [life] domain satisfactions, and global judgments of life satisfaction" (p.277). Though an empirical model does not exist for how goal progress may directly affect subjective well-being or general life satisfaction, Carver and Scheier (1990) proposed a meta-monitoring model that explains the relationship between goal progress and affect. In general, the meta-monitoring system proposes the operation of two concurrent feedback systems: the action loop and meta-loop. The action loop monitors an individual's goal progress. In turn, the meta-loop monitors the rate of goal progress in relation to the individual's expected rate of progress. If the individual has achieved the expected rate of progress, then the meta-loop detects no

discrepancy, thus causing no change to affect. If the individual's progress is *less* than expected, the discrepancy evokes negative affect. On the other hand, if the goal progress is *more* than expected, the discrepancy results in positive affect. Though this model does have its critics (Locke & Latham, 2002), it provides a parsimonious explanation of the relationship between goal progress and affective variables, such as well-being.

Consistent with the Carver and Scheier (1990) model, empirical findings provide general support for the positive relationship between goal progress and all three facets of well-being (Steca et al., 2016).[2] However, the evidence on the positive effect of goal-related interventions on well-being is mixed. For example, Sheldon, Kasser, Smith, & Share (2002) had counselors teach underperforming undergraduate students four goal-focused strategies and found no significant increase in goal progress. Though they found that individuals who made more goal progress had increases in positive affect and decreases in negative affect ($\beta = .26$), they could not conclude that their treatment had any effect on well-being due to it being ineffective overall. Noteworthy, however, is that none of the strategies involved had participants set specific, challenging goals (Locke & Latham, 1990, 2002) or form implementation intentions (Gollwitzer, 1999).

In contrast, Fishbach and Hofmann (2015) asked participants to identify four daily goals for two weeks. After identifying their goals, participants received either control instructions or instructions to identify barriers to their goals and resolutions to those barriers. Participants that received the implementation-like instructions made more goal progress on highly challenging goals ($b = .43$) and reported increases in positive affect (b

[2] Not enough information was provided by Steca et al. (2016) to calculate effect sizes, but betas were provided: positive affect: $\beta = .266$, negative affect, $\beta = -.163$, and life satisfaction, $\beta = .293$.

= .63).[3] General life satisfaction was not measured, and with their one-item affective measure, participants could not simultaneously score high on positive and negative affect. Though Fishbach and Hofmann's (2015) study did not assess life satisfaction, MacLeod, Coates, and Hetherton (2008) found mixed results with some interventions boosting scores and others having no effects. However, the authors caution that their inconsistent findings may be due to their small sample size and consequential low power. Overall, it appears that goal setting strategies which involve planning (implementation intentions) bolster goal progress and, in turn, multiple facets of subjective well-being.

1.5.1 Summary

Findings to date on the relationship between goal progress, affect, and well-being suggest a positive relationship. The current study examines the hypothesized impact of positive changes in goal progress, brought about by IR training on well-being and life satisfaction. Extrapolating from prior research, I expected that:

> *Hypothesis 6: Life satisfaction and positive affective well-being will be higher at post-training and follow-up than at pre-test for participants in the IR training condition compared to participants in the control condition (.2 < d < .5).*

Except for when statistical power was a concern, past research findings and common sense suggest a positive relationship between goal progress and both life satisfaction and affect (Fishbach & Hofmann, 2015; MacLeod et al., 2008; Schmuck & Sheldon, 2001; Steca et al., 2016). Because the self-control strategies are hypothesized to be effective, they will indirectly increase well-being by increasing goal progress.

[3] Similarly, only b weights were reported by Fishbach and Hofmann (2015)

1.6 Retention and Transfer of Goal-Setting Strategies

Though some studies have shown goal-setting training strategies, including the development of implementation intentions, to have long-lasting, positive effects (Chapman & Armitage, 2010; Richards & Perri, 1978; Stadler, Oettingen, & Gollwitzer, 2010), it is unclear how likely individuals are to transfer these strategies following training, and calls have been made to study the transferability of these strategies (see Fishbach & Hofmann, 2015). For example, Stadler, Oettingen, and Gollwitzer (2010) taught middle-aged women about the benefits of greater fruit consumption. In addition to the nutrition education, half of the women were also taught an implementation strategy targeting their fruit consumption. Even after two years, the women that were taught both the nutritional information and implementation strategy increased their weekly fruit consumption by 28% compared to the only 7% increase in fruit consumption by the women in the education-only condition. Though the implementation intentions unambiguously assisted with the women's fruit intakes, this study did not examine if the implementation intentions spilled over into different domains. The participants may have viewed the strategy as *only* applying to their specific goal of increasing their fruit consumption. If this scenario is true, then the prospects of the implementation strategy being transferred to novel situations, such as money management, are grim. On the other hand, the women could view the implementation intention strategy as a general goal-setting tip. If this is the case, then the likelihood of the strategy transferring to different domains is much greater.

In addition to retention, transfer depends on how dissimilar the novel situation is to the original one. If the novel situation is in the same domain as the trained one, then

transfer is more likely than if the novel situation is in a completely different domain than the original situation. More concretely, if individuals learn a memory strategy for remembering words in French, then they are more likely to transfer that skill to remembering words in English rather than to math formulas (Lange & Süb, 2015).

While the transfer literature paints a bleak picture of the transferability of many interventions (Baldwin & Ford, 1988), there are steps that can be taken to increase the likelihood of both near-transfer and far-transfer. For instance, during many interventions, individuals become conditioned to apply the intervention in the presence of the training environment or the instructor (Marholin II, Siegel, & Phillips, 1976). As a result, interventions show little transfer in the absence of training environment cues or the instructor who cues the application of the skill. Thus, to promote the transferability of an intervention, the training environment should be more generalizable, and the teacher's presence should be minimized. In addition to conditioning, many individuals do not immediately consider transferring trainings to novel situations. To overcome this limitation, Marholin II et al. (1976) theorize that training instructions should explicitly tell individuals to try to apply these skills outside the immediate scenario. Next, as with most learning, repetition helps with retention and, as a result, may help with transfer too (Corrigan & Basit, 1997). Consequently, any training should include many opportunities for individuals to practice the new skill in a variety of ways. Finally, in favor of many self-control and implementation strategies, direct instructions tend to be resistant to extinction, thus increasing their likelihood of being retained and the potential of being transferred (Marholin II et al., 1976). With these findings in mind, a prospective implementation strategy intervention should take place in a generalizable setting with

unobtrusive interaction from the teacher, inform trainees explicitly to generalize the training, and afford many opportunities to repeat the process in a variety of settings.

Hypothesis 7: Participants in the IR training condition will make more daily and weekly progress in the third (no intervention) week than participants that only received the control treatment (.4 < d < .6).

Hypothesis 7a: Participants in the IR training condition will make more progress in the third (no intervention) week than during their first week (baseline training, (.4 < d < .6).

Because none of the participants received the prompts in the third week and both interventions are framed as a treatment, between-group differences in goal progress in week three can only be explained in terms of transfer of the strategies. Goal progress in the third week is viewed as a proxy of transfer and persistence of goal setting, as participants are likely to have conceptually similar goals week to week. Due to the experimental intervention being hypothesized to be more effective than the control strategy, it follows that the experimental group would continue performing better if they have transferred the strategies. Furthermore, to crosscheck that the experimental group has transferred their strategy, end of week baseline goal progress was compared to their end of week follow up goal progress. Any within subject differences were presumed to be due to lingering effects of the treatment.

Hypothesis 8: Participants that receive the IR training intervention will be more likely to transfer the IR strategy to a novel avoidance-based situation than participants who received the control intervention (.2 < d < .5).

Hypothesis 8a: Participants that receive the IR training intervention will be more likely to transfer that strategy to a novel approach-based situation than participants who received the control intervention (.2 < d < .5).

With very few limitations (explained in the methods), participants will be able to select their own goals. Thus, even though I do not hypothesize a difference between the transferability of the experimental intervention to approach and avoidance goals, both goal types are chosen in case participants select only approach-based goals ("study for five hours") or avoidance-based goals ("don't drink alcohol at the party"). I hypothesized that participants in the IR condition will find their treatment more useful and will report greater intentions to keep using the strategy after the study than participants in the control group. Because participants in the IR condition will be more likely to continue using the strategy post-study, I also hypothesize that they will start by doing so in this novel situation.

1.7 The Present Investigation

The study examined the relative efficacy of an enhanced goal setting training intervention on goal progress during training, perceived utility of the training, and transfer of training to a new personal goal domain. Specifically, participants in the enhanced training condition (i.e., IR: identification and resolution of goal conflicts) were hypothesized to demonstrate significantly greater goal progress, higher levels of perceived training utility, and greater transfer of training/performance compared to participants in a placebo only (control instructions) training condition. The study also examined the moderating effects of individual differences in ASO on goal progress in each condition.

All participant data were collected via smartphones using ESM. Using a training procedure adapted from Fishbach and Hofmann (2015), participants were asked to identify daily goals in four domains (explained in methods) over a three week period and monitor their progress. Additionally, they received one of two goal trainings (control or IR) during their second week. Prior to the first week of goal selection, all participants completed ASO and baseline life satisfaction well-being measures. During Week 1, all participants were prompted to identify daily goals, goal progress, and daily affect using smartphone technology. At the end of Week 1, participants completed the life satisfaction measure again and assessed their overall goal progress for the week. At the start of Week 2, participants were randomly assigned to the IR or control condition. Participants in the IR condition were administered enhanced goal-strategy instructions that emphasized both identification and resolution of goal-related barriers. Participants in the control condition received instructions asking them to be mindful of their current surroundings while selecting their goals. Participants in both groups were then instructed to identify daily goals, goal progress, and daily affect using smartphone technology. At the end of Week 2, participants once again completed the life satisfaction measure and assessed their overall goal progress for Week 2.

At the start of Week 3, all training prompts were discontinued and all participants were instructed to continue identifying goals, monitoring goal progress, and giving feedback on their daily affect. On the last day of Week 3, all participants completed measures assessing well-being, overall goal progress during Week 3, assessments related to training transfer to novel financial goals, declarative knowledge retention of their Week 2 training, and perceived strategy usefulness.

This design makes it possible to address four issues related to the value of self-control interventions that emphasize planning on goal progress, performance, and well-being. Specifically, the results of this study were expected to:

1) Provide additional empirical evidence for the beneficial role of enhanced goal strategy training that includes a conflict resolution component on goal progress and performance.

2) Demonstrate the moderating effect of ASO on the implementation intention-goal progress relationship.

3) Provide additional support for the positive relationship between goal progress and well-being.

4) Provide empirical evidence on the superior retention and transferability of enhanced goal strategy training to a new goal domain following training.

CHAPTER 2. METHOD

2.1 Participants

To be included in the study, participants were required to be a native English speaker, own an Android or Apple smartphone, and have access to either Wi-Fi or cellular data in order to complete the daily surveys. From a power analysis, it was determined that the study required a sample of 100 participants for at least .8 power for all hypotheses assuming a 100% response rate and effect sizes similar to the unstandardized regression coefficients reported in Fishbach and Hofmann (2015).[4] As many ESM studies have less than 80% response rates (see Hofmann & Patel, 2015), 158 volunteer participants were ultimately recruited from SONA, a School of Psychology online recruitment tool, as well as from psychology classes using online postings. Participants received either extra credit or course credit for their participation. As decided during the proposal meeting, only participants who responded to more than 60% of available surveys were retained for final analyses as to ensure sufficient data points for each participants. These criteria resulted in a final sample size of 142 participants (89% completion rate) with ten participants being dropped from the experimental group and six from the control group. A chi-square was performed comparing the noncompleters to completers on various demographic characteristics. Noncompleters and completers did

[4] More specifically, Fishbach and Hofmann's (2015) reported effect sizes were: B = .41 for intervention, B = -.26 for assessment (conceptually similar to ASO), and B = .50 for the interaction of intervention with ASO.

not significantly differ on gender (Completers: 83 female; $\chi^2 = 0.002$, df = 1, $p = 0.965$) or ASO ($\chi^2 = 19.015$, df = 21, $p = 0.584$); however, noncompleters and completers differed significantly on ethnicity ($\chi^2 = 20.65$, df = 4, $p < 0.001$; Completers: 56 Asian/Pacific Islanders, 16 Black/African American, 10 Hispanic/Latino, 56 White, 4 Other vs. Noncompleters: 6 Asian/Pacific Islanders, 3 Hispanic/Latino, 9 White). Noncompleters also made less daily goal progress ($M = 4.10$) on average than completers ($M = 4.35$; $\chi^2 = 24.202$, df = 6, $p < 0.001$). While this difference in goal progress is statistically significant, it should be viewed with some skepticism, as the average noncompleter identified less than seven goals throughout their participation in the study. After dropping the 16 noncompleters, the overall participation rate was 83% for the experimental group and 84% for the control group.

2.2 Procedure

After signing up for the project, participants were randomly assigned to receive either the control training condition or the IR training condition. After providing informed consent, all participants were emailed video instructions about the study and instructions on how to download and set up their MetricWire account on their smartphone. Once participants activated their MetricWire accounts, they completed measurements relating to ASO (ACS-90) and life satisfaction (SWLS; all measures will be elaborated in the measure section) and demographics from their smartphone.

Daily surveys: Weeks 1, 2 and 3. Throughout the entire study, all participants completed three daily surveys. During the first two daily surveys, participants were asked to identify a goal. During the third and final survey of the day, participants were

asked about their goal progress for that day and completed a brief measure of daily affect (PANAS). Daily surveys were sent to participants using the following schedule:

Daily Survey 1: Randomly between 8 a.m. and 12 p.m.

Daily Survey 2: Randomly between 12:30 p.m. and 3:30 p.m.

Daily Survey 3: 8:30 p.m.

For each survey, participants were allowed two hours to complete the survey before it expired. At the end of each week, participants were also asked to indicate their general goal progress during the past week.

2.2.1 Goal strategy instructions provided to all participants Week 1

For the first two daily surveys, participants were asked to "Please think of a goal that you plan to accomplish today that fits into one or more of the following categories: academic/work, health/fitness, emotion management, maintenance, activism, no goal. Check all categories that apply." These categories reflect five of six goal domains previously identified by Fishbach and Hoffman (2015) that require a high degree of self-regulatory ability (financial goals are the sixth category and are omitted in the first two weeks so that they could be examined during the third week investigating transfer effects). After categorizing their goal, participants were then instructed to describe their goal, receiving instructions modified from Fishbach and Hoffmann (2015) as follows:

"Please describe the goal that you just categorized and plan to accomplish today (but that you have not yet started). (Note: this could be something that you are trying to get started, complete, attain, achieve, or master, but it could also be

something you are trying not to do, trying to avoid, or trying to resist from doing. If there is nothing you plan to accomplish, type 'nothing')" (p. 141).

2.2.2 Goal strategy instructions provided in Week 2

At the start of Week 2, participants received different goal strategy instructions depending on whether the participant was assigned to the IR (experimental) training condition or the control training condition. Specifically, participants in the **control** condition were told:

"For this week, you will be using the **Mindfulness Strategy**. Being present in the current moment and aware of our surroundings can help us better achieve our goals. When you make your goals, take note of your current surroundings (e.g. the place you are in, people you are around, etc.)."

In contrast, participants in the experimental **IR condition**, were instructed to apply an "Identify and Resolve Strategy" as follows:

"For this week, you will be using the **Identify and Resolve Strategy**. Proactively identifying potential barriers and ways to resolve them can help us better achieve our goals. When you make your goals, think about who or what might help you achieve them and exactly how you will accomplish your goals."

During Week 2, all participants continued to identify goals. However, after identifying their goal, participants were then prompted to apply either the control treatment, known to the participants as the "Mindfulness Strategy," or the experimental treatment, known to participants as the "Identify and Resolve Strategy."

Participants in the control condition were prompted to apply the Mindfulness treatment during their first two daily surveys with the following instructions:

"Please describe some aspects of your current surroundings (e.g., place you are in, people around) while you were writing this" (cf, Fishbach & Hoffmann, 2015, p. 142).

Participants in the IR condition were prompted to apply the Identify and Resolve treatment during their first two daily surveys with the following instructions:

"Please think for a minute about what might be going to make it difficult to achieve your reported goal today," "Please think for a minute about what or who might be going to help you achieve this today," and "Now, please think for a minute about how exactly you will be going to accomplish this today" (cf Fishbach & Hoffmann, 2015, p. 142).

During the last nightly survey in Week 2, all participants completed a measure of life satisfaction and assessed their overall weekly progress.

At the start of Week 3, participants stopped receiving the IR or control treatments. Instead, participants followed a procedure identical to Week 1. At the end of Week 3, all participants completed the SWLS for a third time and assessed their overall goal progress for the week. All participants then completed two open-ended questions asking them how they would navigate a novel situation to assess potential transfer of their goal strategy training to a new domain: personal finances. After completing these questions, participants were assessed on their declarative knowledge of the goal strategy training they received. Finally, participants were asked about how helpful their treatment was, how much progress they made on their goals last week, and how often they planned on

applying the strategies in the future. Participants were then debriefed and compensated with course credit or extra credit for their participation.

2.3 Measures

2.3.1 Daily Goal Progress

Similar to Fishbach and Hofmann (2015), goal progress for each of the two daily goals was measured by self-report at the end of each day. Participants were first asked to re-identify their two daily goals, one at a time. In between re-identifying their goals, participants were then asked to "Rate the amount of progress that you made on first (second) goal" using a seven-point Likert-type scale ranging from -3 ("much less progress than usual") to 3 ("much more progress than usual").

2.3.2 Action Orientation/State Orientation

ASO was assessed prior to the experience sampling procedure using a revised version Action Control Scale – 90 (ACS-90;(Diefendorff et al., 2000). Though the revised ACS model has slightly lower reliability in comparison to its predecessor (Kuhl & Beckmann, 1994), the revised ACS-90 is shorter and, more importantly, fits confirmatory factor analysis (CFA) models better than the original scale (Kuhl, 1994). The revised ACS-90 consists of 22 forced-choice items divided into three subscales: preoccupation-disengagement (eight items, Cronbach's $\alpha = .66$), hesitation-initiative (eight items, Cronbach's $\alpha = .74$), and volatility-persistence (six items, Cronbach's $\alpha = .51$). For each subscale, higher scores represent greater action orientation (disengagement, initiative, volatility). The revised ACS-90 exhibits good convergent validity, with high action orientation being negatively related to the Beck Depression

Inventory (r = -.49), escape-related thoughts (r = -.56), and cognitive interference (r = -.41, Diefendorff et al., 2000).

A sample item from the preoccupation-disengagement subscale includes: "If I've worked for weeks on one project and then everything goes completely wrong with the project: A. It takes me a long time to adjust myself to it. B. It bothers me for a while, but then I don't think about it anymore." In this example, choice A represents a state-orientation response.

A sample item from the hesitation-initiative subscale includes: "When I have to take care of something important which is also unpleasant: A. I do it and get it over with. B. It can take a while before I can bring myself to it." In this example, choice A represents an action-oriented response.

A sample item from the volatility-persistence subscale includes: "When I am busy working on an interesting project: A. I need to take frequent breaks and work on other projects. B. I can keep working on the same project for a long time." In this example, choice A represents a state-oriented response.

2.3.3 Well-Being

Well-being was assessed in terms of general life satisfaction as well as daily positive and negative affect (Diener et al., 1999). The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) was used to assess general life satisfaction. The SWLS is a five-item global assessment of well-being with good reliability (Cronbach's $\alpha = .87$). Furthermore, the SWLS also shows good convergent validity with Fordyce's (1978) percent of time happy (r = .62) and self-esteem (r = .54)

and discriminant validity with neuroticism (r = -.48). Sample items include "I am satisfied with my life" and "The conditions of my life are excellent." All items are scored on a seven-point Likert-type scale ranging from 1 ("Strongly disagree") to 7 ("Strongly agree"). Participants completed this measure at three time-points to detect potential changes as a result of the intervention: at the start of the study, at the end of the treatment week, and at the end of the study. .84 to .87; .75 and .81

Positive and negative affect was measured using a shortened 10-item version of the Positive and Negative Affect Schedule (PANAS; Kercher, 1992; Watson, 1988). Each night after reporting their goal progress, participants recorded their affect for the current day ranging from 1 ("Not at all") to 5 ("Very much"). For positive affect, participants identified how excited, enthusiastic, alert, inspired, and determined they felt that day. For negative affect, participants identified how distressed, upset, scared, nervous, and afraid they felt that day.

While the full 20-item scale has shown slightly higher reliabilities than the shortened 10-item version (for positive affect: Cronbach's $\alpha = .84$ for full version versus .75 for abbreviated; for negative affect: Cronbach's $\alpha = .87$ for full versus .81 for abbreviated; Kercher, 1992), the shortened scale was selected to reduce participant burden and increase compliance.

2.3.4 Demographics

Participants also completed a brief demographics survey prior to beginning the experience-sampling portion of the study. The demographics survey assessed gender,

ethnicity, age, and college major. While there were no hypotheses related to any of these criteria, this information was collected for possible future research questions.

2.3.5 Retention

Retention of goal strategy training instructions was assessed by asking participants the following open-ended question: "What do you remember from the **Mindfulness Strategy** (or **Identify and Resolve Strategy**)? Please explain how someone would use this strategy to accomplish his or her daily goals."

Participant responses were coded into one of three ratio categories: 1) did not recall the intervention protocol, 2) partially recalled the intervention protocol, or 3) fully recalled the intervention protocol. Scores were determined by two independent coders (i.e., the author and a trained undergraduate rater) who achieved good reliabilities (90% for retention of Mindfulness strategy and 88% for retention of Identify and Resolve Strategy). Disagreements were resolved through discussion.

2.3.6 Transfer

Transfer was assessed in two ways. The first assessment focused on if participants applied their strategy during the third week without being prompted. To measure this application, participants' daily goal progress during the third week was compared to their baseline progress. During baseline and third week, participants were asked to set daily goals, but they received no treatment prompts. Instead, goal progress during the final week was assessed by asking: "During the last week, how much progress have you made on your goals that you've set for yourself?" with the same seven-point Likert-type scale options as used in daily progress measures. Thus, if the participants choose to continue

applying the strategies after the intervention, then they will have transferred them to goals in the same category.

A second conceptualization of transfer was assessed by having participants answer the two open-ended questions about hypothetical goals. Because the study design allowed for participants to select both avoidance goals ("don't eat chocolate") and approach goals ("eat more fruit"), one hypothetical scenario is avoidance-based and the other is approach-based. The avoidance-based scenario is:

> Imagine that you are trying to save money for a large purchase. Your friends, however, invite you to join them at the mall where you know that many of your favorite items are on sale. Assuming that you want to see your friends and that the only way to see them today is joining them at the mall, how do you prevent yourself from spending money? Be as detailed as possible in your response and thought process.

The approach-based goal is:

Imagine that you are trying to save money for a large purchase. You need to do grocery shopping, but you want to shop strategically to save as much money on your purchases as possible. Assuming that you could not simply buy fewer groceries, what could you do in order to save money on your purchase? Be as detailed as possible in your response and thought process.

Financial goals were chosen for three reasons. First, this goal category is the sixth goal identified by Fishbach and Hoffmann (2015) as a domain that requires a high degree of self-regulation in order to be successful, similar to the goals that participants have

already been selecting. Second, because participants were not allowed to select financial goals during the study, participants would have to generalize their treatments and could not rely on direct experience through the intervention. Third, it was hypothesized that individuals may have more experience setting financial goals than other high self-regulation goals, such as activism goals, so this category minimizes the chance that a participant would have no previous experience in this domain.

Participant responses were coded into one of five categories: 1) did not apply the experimental/control strategy, 2) partially applied the experimental/control strategy, 3) fully applied the experimental/control strategy. Scores were determined by two independent coders who achieved perfect reliabilities (100% agreement).

2.3.7 Perceptions of Training Utility

Perceived usefulness of the intervention was assessed with two items. The first question assessed the overall helpfulness of the interventions by asking participants "How helpful was the **Mindfulness Strategy/Identify and Resolve Strategy** in helping you accomplish your goals?" Responses were scored on a five point Likert-type scale ranging from 1 ("Very unhelpful") to 5 ("Very helpful").

Next, perceived utility was measured by assessing how likely participants believed that they would continue using the intervention strategy after the completion of the study. This commitment dimension was measured by asking participants, "How likely are you to continue using the **Mindfulness Strategy/Identify and Resolve Strategy** in the future?" Responses were scored on a five point Likert-type scale ranging from 1 ("Very unlikely") to 5 ("Very likely").

CHAPTER 3. RESULTS

3.1 Data Cleaning Procedure

Due to a limitation of the ESM software (MetricWire) used for the present study, participants had to re-identify their daily goals each night in order to record their goal progress. Ideally, if a participant selected a goal of "run a mile" in one of the daytime surveys, the software would have asked how she did on her "run a mile" goal that night. Unfortunately, the software did not allow for piped responses, so participants needed to restate what their earlier goals were in order to record their progress.

To work around this limitation, participants were encouraged to write down their goals somewhere in their phone to reduce reliance on memory. However, because memory is not fully accurate, all goals were first analyzed through a matching code and manually reviewed. Using version 3.6.1 of Python (van Rossum, 1995) and the fuzzywuzzy module, the data from the daytime and nighttime surveys were read so that each column within each line could be identified separately. Daytime and night goals were then compared with a partial ratio at an accuracy rate of .8. That is, as long as the characters describing the goal for the day matched with 80% accuracy, the goals were matched automatically. This level of specificity was chosen because pilot testing of 100 goals revealed that it made no false-positive matches. Any goals matching less than 80% were manually checked and matched if they were clearly referring to the same activity (i.e. "run for a mile at the gym" and "go to the gym to run a mile"). Further inspection revealed a random technical glitch that separated 68 goals from the date that they were made. As a result, it was impossible to ascertain which week (baseline, treatment, post-

treatment) that they originated and were dropped from further analyses. This resulted in 3635 matched goals across the 142 participants for the three weeks, or an average of approximately 26 goals per participant. Of these goals, 59% pertained to academic/work ("Complete Chinese homework"), 25% to health/fitness ("go to the gym today"), 11% to emotion management ("relax and meditate"), 9% to maintenance ("organized closet"), and 3% to activism ("package food for the homeless").[5]

3.2 Analyses

All analyses were performed in R Studio using version 1.0.153 (R Core Team, 2017) and the lmertest, nlme, lme4, and lattice packages. Because goal progress and affect (Level 1) were nested in participants (Level 2), multilevel modeling was used to account for correlations among typical goal progress and daily positive affect. To ensure that this multilevel structure was needed, null models were run to find the relevant intraclass correlation coefficients (ICCs). The average ICC for goal progress was .11. Similarly, the average ICC for positive affect was .42. All non-ICC correlations and group level (i.e. not nested) descriptive statistics can be seen in **Table 1**. As such, the use of hierarchical linear modeling (HLM) was justified, and unless otherwise stated, all subsequent analyses accounted for this nesting within participant. For all analyses, condition was dummy coded with the control group as "0" and the experimental (IR) group as "1." Similarly, week or time point was coded with three levels: baseline week as "0", treatment week as "1", and post-treatment week as "2". All models presented are

[5] Participants classified their own goals and were able to classify a goal into multiple categories, so percentages exceed 100%.

based on the fixed effects, as even when the random effects models were significant, they did not fit the data significantly better than the more parsimonious fixed models. In addition, as all hypotheses except for Hypotheses 2 and 3 relied on linear models, unless otherwise stated, all means reported are at the group level. All descriptive statistics and correlations can be found in **Table 1**.

Table 1

*Correlations among and Descriptive Statistics for Relevant Variables**

	Mean	SD	1	2	3	4	5	6	7	8	9	10
Week	--	--										
Condition	--	--	-.02	--								
ASO, Total	11.97	4.30	.00	-.05***	.76							
ASO, Disengagement	3.42	2.25	.00	-.10***	.72***	.71						
ASO, Initiative	4.18	2.30	.00	.09***	.79***	.29***	.73					
ASO, Persistence	4.38	1.49	.02	-.14***	.54***	.09***	.25***	.58				
Goal Progress (Day Level)	4.35	2.08	.03	.06***	.08***	.03*	.13***	-.02	--			
Overall Goal Progress (Week Level)	4.45	1.19	.23***	.09***	.28***	.03	.42***	.11***	.23***	--		
Daily Positive Affect	1.68	.94	-.06***	.02	.17***	.11***	.17***	.06***	.25***	.24***	.78	
Satisfaction with Life	23.73	6.42	-.01	.04*	.30***	.19***	.26***	.15***	.09***	.22***	.32***	.85

*All presented means are at the group level. Cronbach Alpha's are reported on the main diagonal for survey items with more than 1 item.

* $p < .05$ ** $p < .01$ *$p < .001$

3.3 Effectiveness of Goal Setting Strategy

Hypothesis 1 stated that there would be a main effect of treatment, such that participants receiving the IR treatment would make more goal progress than participants receiving the control strategy. Relatedly, Hypothesis 1a stated that participants receiving the IR treatment would make more progress during the treatment week than during baseline. To test these hypotheses, the factors of condition, week, and the interaction were all regressed on daily goal progress aggregated across the week (**Table 2**). There was no significant main effect of condition, $t(266) = 1.706$, $p = .089$. More importantly,

no significant interaction between condition and week emerged, $t(3550) = -.730$, $p = .465$.

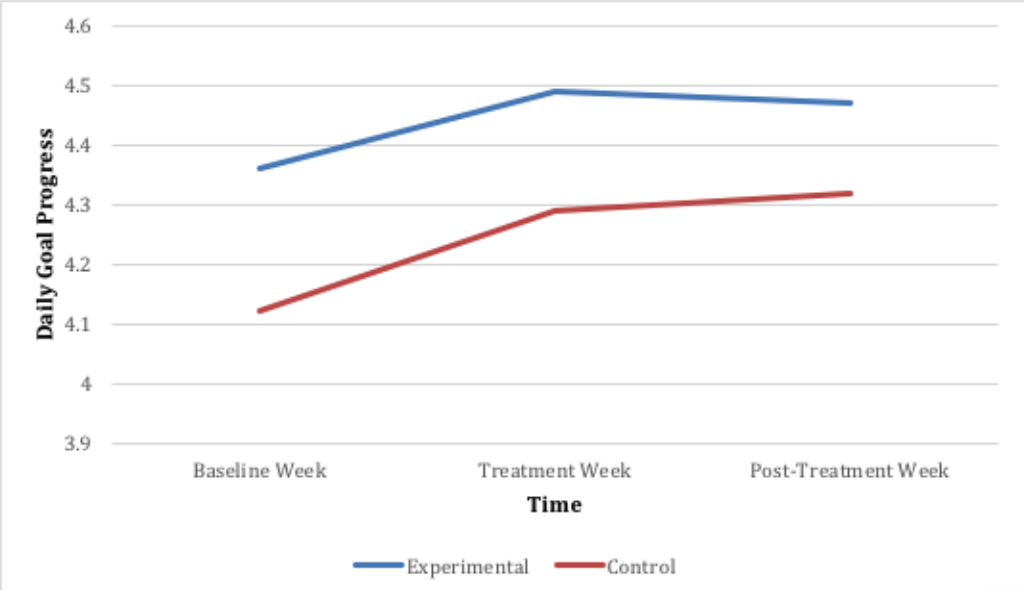
Table 2

Summary of Regression for Daily Goal Progress by Condition and Week

	B	*Std. Error*	*df*	*t*	*p*
Intercept	4.129	0.112	279	36.934	-
Condition	0.267	0.157	266	1.706	.089
Week	0.113	0.059	3552	1.912	.056
Condition x Week	-0.060	0.082	3550	-0.730	.465

Figure 1

Interaction between Condition and Week on Daily Goal Progress (Non-significant)



To try to explain these null findings, exploratory post-hoc tests were performed. These tests revealed an unexpected marginal main effect of time, $t(3552) = 1.912$, $p = .056$, as shown in **Figure 1**. While not hypothesized, this marginal main effect was further followed up to see if it could explain the lack of treatment effect. Post-hoc pairwise comparisons showed that participants in both conditions made more goal progress during the treatment week in comparison to baseline. Specifically, participants made marginally more progress during the treatment week ($M = 4.39$, SD = 2.10) than during the baseline week ($M = 4.25$, SD = 2.04), $t(2355) = 1.928$, $p = .054$. Moreover, this trend persisted beyond the treatment week: participants made significantly more progress during the post-treatment week ($M = 4.39$, SD = 2.08) than during the baseline week ($M = 4.25$, SD = 2.04), $t(2282) = 1.964$, $p = .05$; however, participants made similar amounts of goal progress in the treatment week ($M = 4.39$, SD = 2.10) and post-treatment week ($M = 4.39$, SD = 2.08), $t(2399) = 0.170$, $p = .865$. Thus, while Hypothesis 1 and 1a were not supported, this positive trend may partially explain their null differences in terms of placebo effects. Furthermore, because no significant interaction of condition and time point emerged, Hypotheses 7 and 7a were also not supported. Hypothesis 7 predicted that participants in the IR condition would make more progress during the post-treatment week ($M = 4.47$, SD = 2.10) than participants in the control condition ($M = 4.32$, SD = 2.06), $t(1180) = 0.954$, $p = .340$. Similarly, Hypothesis 7a stated that only participants in the IR condition would make more progress during the post-treatment week ($M = 4.47$, SD = 2.10) than during the baseline week ($M = 4.36$, SD = 2.08), $t(1211.2) = 1.325$, $p = .185$. Because both groups may have performed marginally better, not just the participants in the IR condition, this hypothesis was not

supported. All group level means and standard deviations relating to daily goal progress by condition, week, and condition by week can be found in **Table 3**.

Table 3

Descriptive Statistics for Daily Goal Progress Aggregated Across Week

	Condition								
	Control			Experimental (IR)			All		
Week	Mean	SD	N	Mean	SD	N	Mean	SD	N
Baseline (Week 1)	4.123	2.080	536	4.361	2.004	604	4.249[ab]	2.042	1140
Treatment (Week 2)	4.290	2.088	645	4.489	2.108	646	4.390[a]	2.100	1291
Post-Treatment (Week 3)	4.318	2.056	595	4.471	2.099	609	4.395[b]	2.089	1204
All	4.255	2.077	1776	4.439	2.070	1859	4.350	2.079	3635

Note: All means are at the group level. N reflects the number of individual goals that contribute to their respective descriptive statistics. Values with similar superscripts are different at $p < .1$

In addition to looking at daily goal progress aggregated across the week, participants were also asked to provide subjective perceptions of their overall goal progress once at the end of each week (baseline, treatment, and post-treatment). Because this measure of subjective, overall goal progress was only asked three times, only participants that completed all three weekly assessments were included in these analyses, resulting in a sample size of 67 participants for this measure. This restrictive complete case analysis was chosen because it is impossible to ascertain if this data is missing at random, especially because the majority of participants missed at least one of these measures. With this high degree of incomplete cases, it is recommended not to impute missing values, thus resulting in this more limited sample (Ader, Mellenbergh, & Hand, 2008). Condition, time, and their interaction were regressed onto participants' overall

goal progress scores (**Table 4)**. The results of the subjective overall progress for the week mirrored the results of aggregated day level progress. Once again, there was no significant main effect of condition, $t(149.99) = -0.669$, $p = .504$, or interaction of condition with week, $t(146.65) = 0.792$, $p = .430$.

Table 4

Summary of Regression for Overall Weekly Goal Progress by Condition and Week

	B	*Std. Error*	*df*	*t*	*p*
Intercept	4.169	0.191	153.69	21.836	-
Condition	-0.176	0.263	149.99	-0.669	.504
Week	0.242	0.123	146.65	1.964	.052
Condition x Week	0.133	0.168	146.65	0.792	.430

To try to explain these null findings on the week level, the same exploratory post-hoc tests that were conducted on the day-level were repeated. Another marginal main effect of time emerged, $t(146.65) = 1.964$, $p = .052$. As with the aggregated day level progress, pairwise comparisons were performed to see which weeks differed from the baseline week. Participants again assessed making significantly more overall goal progress during the treatment week ($M = 4.54$, SD = 1.03) than at baseline ($M = 4.00$, SD = 1.27), $t(81.22) = 3.127$, $p < .002$. Moreover, this trend continued into the post-

treatment week: participants reported more overall goal progress during the third week (M = 4.63, SD =1.11) than during baseline (M = 4.00, SD = 1.27), $t(81.22) = 3.127$, $p < .002$. Mirroring the aggregated day level progress results, the amount of overall goal progress during the treatment week (M = 4.54, SD = 1.03) did not differ from overall goal progress during the post-treatment week (M = 4.63, SD =1.11), $t(75.29) = 0.64$, $p = .524$. In sum, at both the day and week levels, none of the treatment hypotheses related to goal progress were supported. While these null findings may be in part due to marginal effects, these post-hoc explanations should be interpreted with caution.

3.4 Perceptions of Strategy Helpfulness

Hypothesis 2 concerned participants' perceptions of the usefulness of their assigned strategy, and Hypothesis 3 focused on their likelihood to continue using the assigned strategy after the study's completion. Both hypotheses presumed that participants in the IR condition would perceive that strategy as more useful and would be more likely to continue using it than participants in the control condition. Unfortunately, neither hypothesis was confirmed. As strategy usefulness and likelihood of continued use were only assessed once at the end of the study, comparisons were made using one-tailed Welch two sample t-tests. Participants using the IR strategy (M = 1.80) were no more likely to find it useful than participants using the control strategy (M = 1.53), $t(123.13) = 1.4891$, $p = .070$. In addition, participants using the IR strategy (M = 3.09) were just as likely as participants using the control strategy (M = 2.86) to continue using the strategy after the study's completion, $t(125.58) = 1.104$, $p = .140$. Thus, Hypotheses 2 and 3 were not supported.

3.5 Action-State Orientation

Hypotheses 4 and 5 focused on how individual differences in ASO would affect goal progress and interact with condition, respectively. Hypothesis 4 stated that participants higher in ASO (more action-oriented) would make more goal progress than participants low in ASO (more state-oriented). Likewise, Hypothesis 5 stated that participants low in ASO would benefit the most from the IR treatment. More specifically, Hypotheses 5a and 5b focused on the initiative and disengagement ASO subscales, respectively, and claimed that participants scoring low in these facets would make greater progress in the IR condition than in the control condition.

While some studies have used categorical splits, such as median splits, when assessing ASO (for example, see Ruigendijk & Koole, 2014), the present study treated ASO as a continuous variable in all analyses, as median splits can drastically reduce power and typically involve arbitrary cut-off points (Cohen, 1983). To test for the potential main effect of ASO, ASO was grand mean centered and then regressed onto goal progress. ASO did not significantly predict daily goal progress, $t(139.54) = 1.717$, $p = .088$. To test for ASO's potential interaction with treatment, ASO was once again grand mean centered, and then it, condition, and their interaction were regressed onto goal progress (**Table 5**). This same procedure was also repeated for the initiative and disengagement subscales as well. Similar to Hypotheses relating to the main effect of ASO, the interaction between condition and ASO was also not significant, $t(137.55) = 0.661$, $p = .510$. Thus, Hypothesis 5 was not supported.

For Hypothesis 5a, the interaction between initiative and condition was not significant, $t(135.84) = 0.923$, $p = .358$. For Hypothesis 5b, the interaction between

disengagement and condition was also not significant, $t(138.08) = -0.482$, $p = .631$. Hypotheses 5a and 5b were also not supported.

Table 5

Summary of Regression for Daily Goal Progress by ASO and Condition

	B	*Std. Error*	*df*	*t*	*p*
Intercept	4.093	0.192	134.01	21.331	-
ASO	0.019	0.021	137.01	0.907	.366
Condition	0.063	0.271	135.29	0.232	.817
ASO x Condition	0.020	0.030	137.55	0.661	.510

3.6 Well-Being

Hypothesis 6 stated that after receiving the IR strategy, participants would report greater life satisfaction and higher positive affect than participants who received the control strategy. Similar to overall goal progress, life satisfaction was only measured at three time points. For the same reasons provided for using complete cases for overall goal progress, analyses were restricted to participants who completed all three assessments, resulting in a final sample size of 122 participants for these analyses. Similar to the equation for ASO, condition, time, and their interaction were regressed

onto participants' life satisfaction scores and then run as a repeated measures ANOVA. There were no main effects of condition, $F(1, 195) = 0.010$, $p = .920$, or time, $F(1, 195) = 0.946$, $p = .332$. Furthermore, the interaction of condition and time was also not significant, $F(1, 195) = 0.239$, $p = .625$.

In regards to positive affect, a similar equation was used with condition, time, and their interaction regressed onto participants' daily mean positive affect score (**Table 6**). Mean daily scores were used instead of sums to protect against any missing scale items. No main effects of condition, $t(162) = 1.017$, $p = .311$, or time emerged, $t(3516) = -1.183$, $p = .237$. Furthermore, while the hypothesized interaction between condition and time appeared, $t(3516) = -2.927$, $p = .003$, it was in the opposite direction. To follow up the significant interaction, four planned comparisons were performed. First, the positive affect of participants in the IR condition were compared at baseline to treatment week as well as from baseline to post-treatment week. Similarly, positive affect of participants in

Table 6

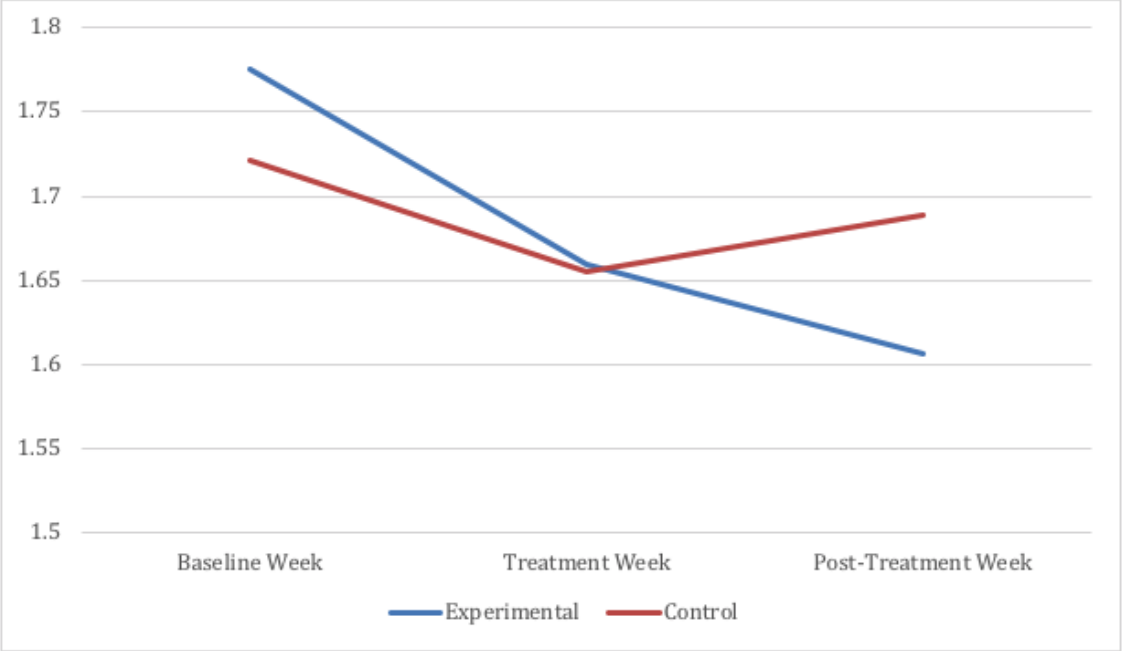
Summary of Regression for Mean Daily Positive Affect by Condition and Week

	B	*Std. Error*	*df*	*t*	*p*
Intercept	1.709	0.079	163	21.704	-
Condition	0.113	0.111	162	1.017	.310
Week	-0.026	0.022	3516	-1.183	.237
Condition x Week	-0.088	0.030	3516	-2.927	.003*

the IR condition during the treatment week and post-treatment week were compared to control group participants' positive affect at those respective time points.

Figure 2

Interaction between Condition and Week on Mean Positive Affect



While participants in the control condition felt similar levels of positive affect week to week, participants receiving the IR strategy reported *less* positive affect as the study progressed (**Figure 2**). Specifically, participants receiving the IR strategy felt less positive affect going from baseline (M = 1.78, SD = 0.91) to the treatment week (M = 1.66, SD = 0.90), $t(1192.2) = -3.73$, $p < .001$. Furthermore, this suppression of positive affect persisted into the post-treatment week, $t(1158.9) = -5.339$, $p < .001$, with participants reporting less positive affect during the third week (M = 1.61, SD = 0.91) than during the baseline week (M = 1.78, SD = 0.91). Finally, at no point did the participants in the IR condition and control group ever significantly differ from one another on positive affect. All descriptive statistics and pairwise comparisons relating to

positive affect can be found in **Table 7**. In sum, Hypothesis 6 was not supported. The trait well-being portion failed to reach significance, and the positive affect portion was significant in the opposite direction

Table 7

Descriptive Statistics for Daily Goal Progress Aggregated Across Week

	Condition								
	Control			Experimental (IR)			All		
Week	Mean	SD	N	Mean	SD	N	Mean	SD	N
Baseline (Week 1)	1.721	0.927	537	1.775[ab]	0.908	607	1.749	0.917	1144
Treatment (Week 2)	1.655	0.978	648	1.659[a]	0.903	647	1.657	0.941	1295
Post-Treatment (Week 3)	1.689	0.994	596	1.607[b]	0.907	611	1.646	0.951	1207
All	1.685	.968	1781	1.680	.908	1865	1.682	0.938	3646

Note: All means are at the group level. N reflects the number of recordings of daily positive affect that contribute to their respective descriptive statistics. Values with similar superscripts are different at $p < .05$

3.7 Transfer

Hypotheses 8 and 8a concerned the transfer of the IR strategy to novel avoidance and approach-based financial goals presented at the end of the post-treatment week, respectively. Unfortunately, while participants did find effective and sometimes novel solutions to accomplish these hypothetical goals, no participant's response in either condition evinced any transfer of their strategy in coming up with their solution according to two independent raters. Thus, Hypotheses 8 and 8a were not supported, and the theoretical and practical reasons for this null finding in particular will be discussed in the discussion section.

CHAPTER 4. DISCUSSION

This study investigated the relative efficacy of an enhanced, planning-focused goal-setting strategy intervention (over a "mindfulness" intervention) on goal progress, the moderating effects of individual differences in ASO on goal progress, and the impact of both forms of goal setting training on subjective well-being and transfer to a new class of goals. Unfortunately, many of the hypothesized relationships were not supported or were discovered in the opposite direction in the case of positive affect. Specifically, treatment type had no significant effect between subjects or within subjects. To explain this null finding, post-hoc tests were performed that revealed a consistent but marginal main effect of time on goal progress. This trend emerged on the aggregated day level and the overall weekly assessments of goal progress. These exploratory tests implied that participants may have made slightly more progress going from baseline to the end of the study; however, the ad-hoc nature of these tests and the lack of traditional significance warrant an appropriate amount of skepticism and caution.

In addition to being hypothesized to assist with goal progress, the IR strategy was hypothesized to also assist with both state well-being and trait well-being. For trait well-being, there were no significant main effects of condition, time, or their interaction. While there was no main effect of condition for state well-being, the interaction between it and condition was significant. Counter to Hypothesis 6, participants receiving the IR strategy reported *less* positive affect during the treatment week in comparison to the baseline week. Furthermore, this suppression of positive affect persisted into the post-treatment week.

Next, ASO was added to the model to see if it explained any of the variance in goal progress and if it interacted with condition. ASO did not predict goal progress nor did it interact with treatment type. When subdivided into two of its subscales, neither the initiative nor disengagement subscales significantly interacted with condition.

In line with there being no significant effect of condition on goal progress, Hypotheses 2 and 3 were also not supported. These hypotheses stated that participants receiving the IR strategy would find it more useful and be more likely to continue using it than participants receiving the control strategy, respectively. Due to the overall lack of effect of condition, these null findings make logical sense. If individuals fail to make additional progress using a strategy, they will not find it useful and will have little to no motivation to continue using it.

Finally, Hypotheses 8 and 8a purported that participants in the IR condition would be more likely to transfer their strategy to novel avoidance-based and approach-based goals, respectively, than participants in the control condition. To test these hypotheses, participants read brief vignettes about financial goals and were asked how they would respond. Unfortunately, all participants simply identified solutions instead of outlining their thought process. It remains unclear if participants responded in this manner because they truly did not apply the strategy or because they no longer consciously relied on it and thus could not verbalize their thought process. More pragmatically, participants may have responded in their short manner simply due to the fact that the survey was being answered over smartphones, and text messages are typically brief. With the current findings, it seems that this response pattern most likely results from the latter, as there were few effects of condition to transfer.

4.1 Theoretical Implications

A major aim of the present investigation was to replicate and extend Fishbach and Hofmann's (2015). To recapitulate the relevant portions of their study, their participants identified four goals a day over a one week period. Approximately half of the participants received IR instructions for two of their daily goals and either no instructions or irrelevant instructions for the other two. The remaining participants only received control instructions. In addition to assessing goal progress, Fishbach and Hofmann also measured individual differences in locomotion and assessment—which are conceptually similar to action-orientation and state-orientation, respectively—as well as a one measure item for daily happiness. Ultimately, they found that participants receiving the IR instructions made more daily progress and reported higher happiness than participants in the control only group. Furthermore, participants high in locomotion made more goal progress and participants high in assessment made marginally less progress. Finally, assessment interacted with condition type, such that participants high in assessment that received the IR instructions made significantly more progress than when in the control condition.

Unlike Fishbach and Hofmann's (2015) findings, the IR strategy implemented in this study was not found to be more effective than the control strategy. Furthermore, it was not found to be more effective than simply identifying goals during baseline. The present investigations null findings are not due to a lack of power, as the present study had both more participants and more individual goals than Fishbach and Hofmann's study. One major difference between the current study and that of Fishbach and Hofmann is that participants in the present study received only one strategy (or no

strategy) at a time. In contrast, all of Fishbach and Hofmann's participants in their IR condition received two sets of instructions throughout the day for different goals. Perhaps using two different approaches simultaneously caused participants to prioritize the IR goals over the control goals and thus make more progress on those goals.

Next, the present study did not find the anticipated main effect of ASO or an interaction of ASO with treatment type. The lack of a main effect may be due to differences in measurement. Individuals high in locomotion, by definition, are more prone to act, and individuals high in assessment tend to ruminate (Kuhl & Beckmann, 1985). However, ASO captures both of these individual dimensions in a single continuum. For instance, someone high in ASO will be more likely to act *and* less likely to ruminate, and the opposite tends to hold for individuals low in ASO. As a result, this more nuanced measure may have had additional noise that prevented it from capturing the same effect that the measures of assessment and locomotion did. Moreover, the interaction likely failed to be reproduced due to the lack of an effect of condition in the present study. Because the IR strategy did not improve participants' goal progress in general, there would not be any reason to expect that it would help only participants low in ASO.

In addition, Fishbach and Hofmann found that participants in the IR condition reported higher levels of happiness than participants in the control group. This finding directly contrasts the present investigation, which found that participants in the IR condition reported *less* positive affect than participants in the control condition. One explanation for this reversal is that Fishbach and Hofmann's finding may be an artifact of measurement. While the present study used the well-validated PANAS, Fishbach and

Hofmann used a one-item measure of happiness. As an alternative explanation unrelated to measurement, this reversal could be the result that participants in their IR condition made more progress than participants in the control group and also made more progress within subject on their IR goals than their control instructions' goals. Perhaps the boosted progress on the IR goals relative to their other goals protected against the deleterious effects of reflecting on the barriers and potential solutions.

This study also extended Fishbach and Hofmann's study by going for three weeks and included a post-treatment week to examine transfer effects. Unfortunately, because no significant effects of condition emerged, there was no opportunity for them to transfer. Despite being unable to detect transfer during this third week, this post-treatment week allowed for detection of the persistent effects of suppressed positive affect in the IR condition.

In sum, the present study failed to provide support for Fishbach and Hofmann's (2015) findings. The main effect of ASO/locomotion was marginally replicated, but the condition effects were either not supported or, in the case of positive affect, found to be in the opposite direction. Finally, the more general findings of this study fall in line with goal setting theory. Because all participants were forced to think of more specific goals, had their attention directed to those goals, and then had to report feedback on their progress, their almost immediate boost in their progress makes theoretical sense (Locke & Latham, 1990, 2002).

4.2 Practical Implications

This study explored the feasibility of training goal strategy interventions using smartphone technology (i.e., no face-to-face interaction with an instructor). Despite the various advantages to smartphone-based interventions, the present study fails to provide support for their use for goal strategies. Though the present investigation used the same difficult goal domains as Fishbach and Hofmann (2015), the difficulty of goals even within these categories varied greatly. Future studies looking to employ smartphone interventions should consider objective measures of goal performance, such as weight loss or grades, and establish methods to ensure that the chosen goals truly are difficult but possible.

Furthermore, the present investigation demonstrated that goal setting strategies may have unintended negative effects on positive affect that persist up to a week after their use. This effect did not result from lack of goal progress, as participants in the control condition did not experience the same downward trend despite making equivalent levels of progress. Future studies should explore why thinking about goal barriers and their solutions was associated with reduced positive affect, even when sufficient goal progress was being made.

5.3 Limitations

Though this study made contributions to the literature, it is not without limitations. The largest limitation is that the ESM software used for the study was unable to automatically link participants' daily goals to their nightly progress surveys. While participants were encouraged to write down their goals in their phone to reduce memory

errors, many times participants wrote down the wrong goal (i.e. their goal was to "run a mile" but at night misremembered their goal as "eat a salad") or could not remember their goal. As a result, these mismatched goals had to be dropped from further analyses, thus possibly affecting the results of the study. For instance, if participants could not recall their goal or misremembered it, then they likely did not accomplish it; however, the software's limitations prevented analyses of this subset of forgotten goals. Future studies employing this design should ensure that their ESM software can pipe participants' earlier responses into their nightly progress surveys in order to reduce this reliance on memory.

Moreover, the use of personally selected goals relied exclusively on participants' self-report of their goal progress. Though participants may have been influenced by demand characteristics to respond in socially desirable ways (i.e. report more progress than they actually made), two precautionary steps were taken to minimize these demands. First, participants never interacted face-to-face with a researcher, thus making their responses seem more anonymous and less susceptible to demand characteristics. Second, even if demand characteristics existed, they should have influenced both groups identically, as both the control and experimental strategies were presented as effective treatments, thus reducing bias towards the true treatment.

Despite these social desirability risks, this methodology was warranted because it increased the likelihood that participants should value these goals and would have taken the interventions seriously. This buy-in by participants is crucial, as past research has demonstrated that goal performance is much higher when participants can select their own goals (Earley & Kanfer, 1985). As participants in both conditions reported making,

on average, slightly more progress than usual, this effect seems to have held. Nonetheless, future researchers could select specific, difficult goals within specific domains, such as doing well in a class (academics) or losing weight (health/fitness), which participants already identify as having.

Finally, while the study's design could parse apart placebo effects, between-subjects differences, within-subject differences, and practice effects, it could not tease apart the strategies from the act of identifying goals and reflecting on their progress. To separate out these effects, a third condition would have had to receive their strategies without identifying goals or their progress. However, because the present study relied on self-reported progress, it would have been impossible to accurately assess progress without having participants identify goals and report on how they did. To work around this limitation, future studies should employ objective measures of goal progress. An objective measure of goal performance would minimize any biases in perceived performance resulting from potential demand characteristics and subjective placebo effects. Furthermore, it would allow for comparison of treatments without the need to prompt respondents to identify their goals and progress.

5.4 Conclusions

While the IR strategy did not exceed placebo effects from the control mindfulness strategy, this study demonstrates that there may be weak but beneficial effects for repeatedly identifying goals and reflecting on their progress on both the day and week levels. While these practice effects were only marginally significant, they fall in line with previous goal setting theorizing about the attentional benefits of setting specific goals on goal progress (Locke & Latham, 1990, 2002). Furthermore, individuals high in

ASO made marginally more progress than individuals low in ASO. While the IR strategy did not enhance the goal progress of low ASO individuals, this finding supports the growing literature that individual differences can predict goal progress and that training should be curated with these differences in mind (Kanfer et al., 2017; Kuhl, 1994). Last and most notably, this study found unexpected evidence that reflecting on barriers and solutions to one's goals can reduce positive affect despite making sufficient goal progress. Moreover, these negative effects may persist up to a week after meditating on these barriers and solutions. This counterintuitive finding contradicts previous research (i.e. Fishbach & Hofmann, 2015) and should be explored further.

In sum, this study provides weak support for smartphone-based goal setting interventions, and no support for any strategy beyond simple identification of goals and progress updates. While these specific strategies at most provided a weak boost to goal progress, the present investigation demonstrated that goal setting strategies may have unintended negative consequences on positive affect. In doing so, the present study clearly highlights the need to explore the relationship between goal setting cognition, affect, goal progress, and ultimately goal attainment.

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